Reimagining Fort Kochi

RoRo Jetty Node Improvement
Tactical Urbanism Report
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Background

The Fort Kochi is an island towards the west of Ernakulam (mainland) and is connected by water and road through various modes of transport. With its historical and ecological heritage, the island attracts considerable inflow of tourists and locals throughout the year. It is also a platform for various local events like carnival, festivals and internationally recognized events like Biennale.

Increased private vehicle ownership and change in modal shift from public to private transport has changed the mobility dynamics in the island. The narrow street widths combined with unregulated parking of 4 wheelers and tourist buses has led to congestion on streets and conflicts at junctions resulting in increased accident risks and air pollution. The area lacks NMT (Non-Motorized Transport) infrastructure and amenities leading to unsafe walkable conditions which is a threat to pedestrian and bicycle users. All of these together take a toll on the local built environment and natural ecosystem, in turn affecting the quality of life.

About the Initiative

Transformative Urban Mobility Initiative (TUMI) is the leading global implementation initiative on sustainable mobility formed through the union of 11 prestigious partners. The objective of the TUMI is to accelerate the implementation of sustainable urban transport development and mitigation of climate change by mobilizing finance, building capacities and promoting innovative approaches.

The ‘Reimagining Fort Kochi’ project developed by WRI India in collaboration with Kochi Municipal Corporation (KMC) got selected as one of the top 10 shortlisted projects of the TUMI challenge for the year 2019-20. The project aims to improve the quality of space, mobility and accessibility in Fort Kochi area through infrastructure, management and provision of information.

RoRo Jetty Node Improvement

The Ro Ro jetty node is one of the important hubs of multiple transport modes - RoRo ferry (passenger vehicle carriers), passenger and tourist boats, city buses, taxis and bicycles apart from private vehicles. Transit centres like bus stand and jetties located at the node facilitates commute to the city (mainland) and back on a daily basis, supported by auto-rickshaws and cycles for shorter trips within the area. The node functions as an activity generator as well as a transition point for both locals and tourists.

The project aims to create improved accessibility in Fort Kochi RoRo jetty node by providing infrastructure, addressing traffic issues and ensuring coordination between different modes of transport (public and private) including NMT and thereby enhance the walkable conditions in Fort Kochi area for both locals and tourists.
Project Development

The project adopts a ‘people centric’ approach that include both physical interventions as well as capacity building exercises to bring about change. The process includes analysis of existing scenario followed by development of a proposal which gets tested on ground through Tactical Urbanism intervention in a temporary fashion for a short period of time. Surveys and documentation are carried out during existing and proposed scenarios - the analysis of which inform the feasibility of the proposal. After necessary alterations if any in the design, the same gets translated to permanent implementation on ground.

1. Existing conditions

The RoRo jetty node being one of the most important transit hubs of Fort Kochi with a high volume of pedestrians and vehicles faces challenges like traffic conflicts and pedestrian-vehicular conflicts, underused open spaces, encroachments, unorganized parking etc.

1.1. Traffic management

As shown in the figure below, the traffic flow at the junction which includes city bus movement in one direction and movement of other vehicles in either direction gets interfered with the vehicles waiting to enter and exiting from the RoRo jetty. While this volume of vehicles is varying depending upon the arrival of RoRo, the carriage way itself has an uneven width to accommodate this incoming volume, creating bottlenecks and resulting in congestion. The buses moving in a clockwise direction, entering from K B Jacob road to the bus stand and exiting on the same road to take a turn at the junction to Bellar Road, also stops at the junction to pick up passangers from RoRo hindering the traffic flow. The access to the bus stand from Bellar road has be encroached
by vendors and blocked for bus movement, forcing buses to pass through the junction. At the same time, the vehicles waiting to enter RoRo encroach on to the footpaths and road leaving no room for pedestrians to walk or cross safely.
1.2. Walking and Cycling

Lack of continuous footpaths, street crossings, safety measures at junctions and defined access to RoRo Jetty and bus stand lead to haphazard movement of pedestrians at RoRo jetty area.

Vendors encroaching the existing footpaths and vehicles waiting to enter RoRo encroaching more than half of the carriage way forces pedestrians to spill over onto the road conflicting with vehicular traffic resulting in an unsafe condition.
1.3. Open Spaces

RoRo jetty area has both dedicated open spaces and residual open spaces along the carriage way which are underused due to lack of function, defined access and poor maintenance. While these spaces have a great potential to be converted into public spaces, they are currently used either for informal parking or waste dumping.

1.4. Parking

The area lacks formal parking spaces both on-street and off-street resulting in haphazard parking at important activity nodes and available open spaces, creating a nuisance for pedestrians and affecting the smooth flow of traffic.
2. Proposal

The proposal aims at addressing the issues at RoRo jetty junction through redefining traffic movement, infrastructure improvement for pedestrians and vehicles, and organizing activities like parking, vending, vehicular line up for entering RoRo etc. in a formal way to negate all kinds of conflicts. It addresses the following components through suitable interventions as listed below.

<table>
<thead>
<tr>
<th>COMPONENTS</th>
<th>PROPOSALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traffic management</td>
<td>Re-defining the circulation pattern</td>
</tr>
<tr>
<td></td>
<td>Alignment of carriage way</td>
</tr>
<tr>
<td></td>
<td>Defining key entry-exit points for various modes</td>
</tr>
<tr>
<td>Walking and Cycling</td>
<td>Defining pedestrian walkways</td>
</tr>
<tr>
<td></td>
<td>Identification of key crossing points</td>
</tr>
<tr>
<td>Open spaces</td>
<td>Provision of shaded spaces, street furniture, seating, resting and vending spaces</td>
</tr>
<tr>
<td>Parking</td>
<td>Re-defining parking zones</td>
</tr>
</tbody>
</table>

2.1. Traffic Management

Traffic management looks at facilitating a smooth flow of pedestrians and vehicles through strategies like redefining vehicular circulation, redistribution of vehicular volume, segregating activities that hinder traffic flow and providing right infrastructure.

a. Redefining circulation pattern

- Creating two one way loops as shown in the figure, where all the vehicles move in one direction which would ease the congestion and conflicts at critical points.

- Reversing the bus movement to follow the one way pattern and at the same time utilizing the existing access which is unused to allow buses to exit and enter at different points and thereby avoiding bus movement through the junction.
b. Alignment of carriage way

➢ Creating an even carriage way of two lane width to accommodate one way movement that would avoid varying volumes of vehicles and thereby facilitate a smooth traffic flow.

➢ Utilizing the residual spaces on either side of the new carriage way to accommodate the pedestrians and another activities which were otherwise spilling on to the roads.
c. Defining key entry-exit points

➢ Providing dedicated spaces and separate entry and exit points for all modes of public transport in the node such as city buses, RoRo, Autorikshaws etc. These spaces are segregated from the carriage way to avoid any kind of spill over or conflicts.

**Bus Stand**

➢ Allowing buses to enter from Bellar Road and exit to K B Jacob road prevent buses taking U turn within the bus stand as in earlier case where both entry and exit were from K B Jacob road. This take out buses from the junction thereby easing the traffic there.

➢ Providing dedicated platforms within the bus stand to facilitate smooth flow of buses and avoiding confusions while boarding.
➢ Separate parking space outside the bus stand for longer AC buses which cannot enter the bus stand due to insufficient turning radius at the new entry.

**RoRo Jetty**

➢ Providing dedicated boarding lanes for two and four wheelers with separate ticket counters, segregated from the carriage way to avoid conflicts.

➢ Allowing the vehicles exiting from RoRo to move only in one direction on entering the carrigae to make the flow smooth.

➢ Creating a dedicated pedestrian access for entry and exit of people with minimal vehicular interference.
Auto Stand

➢ Dedicated space for Autostand at a strategic location accessible from both RoRo jetty and bus stand.

2.2. Walking and Cycling

The design ensure safe movement of pedestrians through continuos footpaths on either sides of the carriage way with crossings at critical points connecting important nodes like bus stand, RoRo jetty, auto stand, parking areas etc. and by slowing down vehicles at the junction with the help of a table top design.
2.3. Open Spaces

The proposal identifies all the residual spaces and underused open spaces in the area to assign functions and develop them into public spaces providing necessary infrastructure like seating, lighting, shaded areas and introducing various activities.

2.4. Parking

The proposal provides dedicated parking areas at walkable distance from important nodes like bus stand, RoRo jetty, activity areas, attractions etc. for organized parking and thereby removing unauthorised on-street parking from the junction and it’s premises.
3. Trial - Tactical Urbanism Intervention

The proposal was translated on ground using temporary materials and tested for 2 days to understand the feasibility of the design. Documentation was carried out during the trial through traffic, pedestrian and parking surveys as well as by interviewing the users of the space.

3.1. Observations and Analysis

During the trial - Tactical Urbanism, all the activities were thoroughly observed and documented to understand what components work, what do not and which need to be altered when going forward.

a. Traffic Circulation

➢ The one-way system facilitated smooth traffic flow on all the roads and helped reduce the volume of vehicle passing through RoRo junction. But, while there are alternate two-way roads connecting B, C and D, which makes A, B, C and D accessible without passing through RoRo junction, it was observed that vehicles from E to D are forced to pass through RoRo Junction with this one way system. To avoid this it would be ideal to make T M Muhammed Road stretch two way as shown in the figure below.
➢ In the proposed route buses have to travel an additional distance of 150m while skipping the junction and taking two rounds on Tower Road in every trip. At the same time passing through the junction adds to diesel consumption and trip time due to traffic conflict at the junction in the present scenario. This suggests that the additional distance of 150m may not have a major impact on cost or time.

➢ Aspinwall bus stop gets skipped in the onward trip as per the proposal. Whereas in the existing scenario Aspinwall stop has only boarding of passengers. They deboard at the bus stand during their return journey. This is getting reversed in the proposal where passengers have to board from bus stand but can alight at Aspin wall. Essentially there is no additional walking as far as regular users are concerned.

➢ If the bus movement has to be retained in the existing direction, the one way loops should be reversed as shown in figure below.
➢ But this will force all four-wheelers to take a U turn inorder to enter RoRo making it difficult for them especially the bigger vehicles considering the existing road width. At the same time this would slow down the traffic on that road while each vehicle try to take a U turn resulting in conflicts.

➢ To avoid this U turn if the four wheeler line up is switched with two wheeler, the four-wheeler line up will extend beyond RoRo junction leading to conflicts and could not be accommodated within River road. Also, this side has multiple entry points like petrol pump, Fishing nets, Vasco square, Water metro jetty etc. which would be blocked.

Hence the tested reverse movement of buses are found to be the best solution.

b. Key Entry-Exit points

➢ Segregated two wheeler and four wheeler line up ensured clear carriage way allowing smooth flow of vehicles passing by and those exiting from the RoRo. Also this allows buses to turn easily while entering the bus stand.
➢ It was observed that two-wheelers come from both Bellar road and River road (opposite directions) to enter RoRo and vehicles coming from River Road are forced to take an entire one way loop to enter two wheeler line up from Bellar road. Instead a direct access has to be provided for two-wheelers from both the roads as shown below.
➢ The proposed entry of auto stand conflicts with the bus stand entry making it unsafe for both. The entry to autostand to be made from the carriage way to resolve the same.

➢ It was observed that the existing space in Auto stand is inadequate to accommodate all the autos resulting in spilling over onto the carriage way. Autos need to be distributed to 2-3 identified points in the area – bus stand exit, River road etc. to address this. Also, there could be a cap on maximum number of autos that can be parked in the stand at a given point of time.

c. Pedestrian Infrastructure

➢ Segregated walkways ensured safety of pedestrians by efficiently regulating and guiding the movement of people
d. Open Spaces

➢ Pocket public spaces created by reclaiming spaces occupied by vehicles and encroachments where used by people efficiently.
e. Parking

➢ It was observed that people consciously did not park in areas which were designated as 'No Parking' zones and they parked wherever there was space available and not designated as 'No Parking'. This indicates that spatial interventions although minimal could create substantial impact on people behavior.

3.2. Key learnings

The assessment of proposal done during testing phase clearly informed the non-negotiable components of the design as well as those elements which need to be altered before its permanent implementation on ground, which are listed in the table below.

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>NON-NEGOTIABLE COMPONENTS</th>
<th>CHANGES TO BE MADE IN THE PROPOSAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>One-way circulation</td>
<td>One way circulation is critical in Bellar Road, River Road and Tower road as the RoW is minimum.</td>
<td>T M Muhammed road to be made two-way</td>
</tr>
<tr>
<td></td>
<td>Direction of one-way must be in the direction of four-wheeler line up to enter RoRo.</td>
<td></td>
</tr>
<tr>
<td><strong>Bus Re-routing</strong></td>
<td>Buses shouldn’t pass through the junction. People may board and alight buses at the bus stand.</td>
<td>Circulation inside the bus stand to be reworked to accommodate parking of buses which take a longer break between trips.</td>
</tr>
<tr>
<td>-------------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Movement of buses must align with the one-way movement and direction of four-wheeler line up.</td>
<td>Vendors to be displaced from bus stand entrance to have enough clearance.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>RoRo Jetty</strong></th>
<th>Segregated lanes for two-wheeler and four-wheeler line up to avoid spill over on to carriage way.</th>
<th>Two-wheeler line up could be given access from River road also along with Bellar Road.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two-wheeler lineup shouldn’t extend beyond RoRo junction. Vendors to be displaced to ensure enough width.</td>
<td>Vehicles exiting should move only in one direction.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Auto stand</strong></th>
<th>Autos to be accommodated within the auto stand and shouldn’t spill over to the carriage way</th>
<th>Entry to the auto stand to be changed to allow autos enter from carriage way and not from the access to the bus stand to avoid conflicts.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pedestrian infrastructure</td>
<td>Dedicated footpath on either side of the carriage way and crossings at critical points</td>
<td></td>
</tr>
</tbody>
</table>

| Spatial improvement of open spaces | Residual and adjacent open spaces to be reclaimed from parking and converted into public spaces for people to rest and socialize | |

| **Parking** | Parking to be removed from all the pocket spaces in junction area and designated parking to be provided within 100-150m | |

| **Signages** | To indicate – one way, bus route, directions, transit stations, entry exits of transit stations, pedestrian infrastructure – walkways, crossings, parking, and no parking etc. No parking signages must have additional information on the nearest parking (direction and distance). | |
4. Final Proposal

Based on the learnings from Tactical Urbanism trial, few alterations were made to the earlier proposal on circulation pattern as well as infrastructure as elaborated below.

4.1. Traffic Management

All the roads in the two loops are proposed as one way except T M Muhammad road. The bus route is retained in the proposed reverse direction (anticlockwise) and avoiding movement through the junction. Parking is proposed to be shifted to dedicated spaces at walkable distance from the junction.
4.2. Infrastructure

Following are the changes made to the design based on learning from the trial.

➢ Separate entry provided for two-wheeler line up from Bellar road and River road.

➢ Entry of auto stand shifted to access from the carriage way as against the bus stand entry.
➢ Dedicated parking space provided in the bus stand for buses halting for a longer period at Fort Kochi.

Below is the overall conceptual plan of the revised proposal supported with three dimensional views of critical areas.
5. Way Forward

TUMI’s scope of work is limited to documentation, design development, stakeholder consultations, and testing of solution on ground temporarily through tactical urbanism intervention. After thorough analysis of the proposal during the trial, the updated design has been prepared and Kochi Municipal Corporation may take this forward for permanent implementation of physical infrastructure as well as enforcement of traffic recirculation with the support of other city agencies.
ANNEXURE A

PERCEPTION SURVEYS QUESTIONS AND FINDINGS
The responses were collated based on 200 survey samples collected during a regular working day scenario and during Tactical Urbanism trial day. A list of questions with collated responses as as follows

1. If safe parking is provided at about 200m-500m distance (5 to 10 min walking distance), then would you prefer to park there and walk?

<table>
<thead>
<tr>
<th>EXISTING SCENARIO</th>
<th>DURING TU</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EXISTING</strong></td>
<td><strong>DURING TU</strong></td>
</tr>
<tr>
<td><strong>Lack of dedicated crossings</strong></td>
<td><strong>Lack of dedicated crossings</strong></td>
</tr>
<tr>
<td><strong>Vehicles not stopping at the crossings</strong></td>
<td><strong>Vehicles not stopping at the crossings</strong></td>
</tr>
<tr>
<td><strong>Speeding of vehicles</strong></td>
<td><strong>Speeding of vehicles</strong></td>
</tr>
<tr>
<td><strong>Higher number of large vehicles like buses</strong></td>
<td><strong>Higher number of large vehicles like buses</strong></td>
</tr>
<tr>
<td><strong>Overtaking at the junctions</strong></td>
<td><strong>Overtaking at the junctions</strong></td>
</tr>
<tr>
<td><strong>Others</strong></td>
<td><strong>Others</strong></td>
</tr>
<tr>
<td><strong>No challenges, I feel safe to cross the streets.</strong></td>
<td><strong>No challenges, I feel safe to cross the streets.</strong></td>
</tr>
</tbody>
</table>

2. What are your challenges of crossing the street in this area?
3. How safe is this area for pedestrians during day and night?

**EXISTING**

- Very safe: 21%
- Moderately safe: 18%
- Safe during day but unsafe at night: 20%
- Very unsafe: 41%

**DURING TU**

- Very safe: 12%
- Moderately safe: 19%
- Safe during day but unsafe at night: 68%
- Very unsafe: 1%

4. If not very safe, what do you think are the reasons for it?

**EXISTING**

- Vehicular pedestrian conflicts: 21%
- Lack of lighting at night: 44%
- No or improper footpaths: 1%
- Anti-social activities in unused pocket spaces: 6%
- Others: 28%
5. If given opportunity what improvements would you like to have in pedestrian facilities?

- Wider and level footpaths
- Removing obstacles like parking, vendors etc. from footpath
- Clean footpaths
- More crossing points
- Safer crossing points
- Improved street lighting
- Easy access for differently abled
- Reduced and slow traffic on road

6. How do you feel using the space?

**EXISTING**
- Feel insecure /uncomfortable:
  - 42%
- Feel secure/ comfortable:
  - 54%
- Feel happy and confident during day and evenings:
  - 18%
- Rarely use the space:
  - 7%

**DURING TU**
- Feel insecure /uncomfortable:
  - 41%
- Feel secure/ comfortable:
  - 47%
- Feel happy and confident during day and evenings:
  - 9%
- Rarely use the space:
  - 3%
7. How do you rate the quality of space?

![Existing Quality Rating](image1)

![During TU Quality Rating](image2)

8. How do you think the space can be improved?

![Existing Improvement Suggestions](image3)

![During TU Improvement Suggestions](image4)
9. Would you like to have a better space in this area where you can relax and spend time?
About WRI India

World Resources Institute India (WRI India) is a research organization that works closely with leaders to turn big ideas into action at the nexus of environment, economic opportunity and human well-being. WRI India Ross Center for Sustainable Cities is WRI India’s largest program dedicated to supporting Indian cities in their journey to be low carbon, resilient and inclusive. WRI India Ross Center works with governments, businesses, multilateral institutions, and civil society groups to develop practical solutions that improve people’s lives and protect nature. Know more on wrcitiesindia.org

The WRI India Team

The team was involved in the preparation of content and graphics for the document. This was achieved through relevant research, data collection and coordination with GIZ, Kochi Mayor, C-HED and other key stakeholders on ground.

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